3 May 1956

MEMORANDUM FOR: THE RECORD

SUBJECT : Project Monitors at [redacted] 25X1
RD-6lea, Tasks I-IV

1. Time and Place of Meetings: The meetings were held 12 and 19 April 1956 at [redacted] 25X1

2. Attendance: [redacted] 25X1

3. Purpose of Meetings:

a. To review general progress on all projects

b. To watch a demonstration of the Image Analysis Apparatus

c. To discuss the idea of developing complete [redacted] 25X1
[redacted] systems designed to effectively perform certain 25X1
basic tasks frequently encountered in practice

4. Discussion: 25X1

The detailed discussion of projects J-177, [redacted]
[redacted] and Image Analysis and a 25X1
discussion of the possibility of integrated [redacted] 25X1
[redacted] systems is in the appendix to this memorandum. 25X1
Various minor details of administration follow.

(1) Survey of [redacted] Personnel - The [redacted] 25X1
[redacted] presently has the following 25X1
personnel full time:

25X1

Supervisory	2
Project Engineer	4
Research	1
Engineer	7½
Jr. Engineer	3
Technician	12

Machinist	1
Secretary	2½
Writer	1
Photo Technician	1
Draftsman	1
Janitor	2
Purchasing	1
Total	39

The projects which are actively underway are supervised by the 4 project engineers. The present set-up is:

[redacted] 25X1

Ad Hoc #6 and Ad Hoc #44
J-163D
Radio Switch

J-177

P-125C (report
Ad Hoc #43

Recorders
Circuitry Studies

In addition the research department consisting of [redacted] is obtaining final data for reports on all research projects (due 4 June 1956). 25X1

The production work on the ST-2 units is supervised by [redacted] and is being done chiefly by technicians. 25X1

(2) Progress Report - The February-March 1956 Progress Report is presently nearly completed.

(3) Discussion on Specifications - A discussion on specifications for ST-2, J-163C, RC-1 was delayed until adequate military specifications are at hand. In particular a copy of MIL-E-5272A, General Specification for Environmental Testing of Navy Aeronautical Equipment is needed.

(4) Regulated Power Supplies - The undersigned is supposed to locate such data as may be available [redacted] on transistorized regulated power supplies. 25X1

(5) Stoddart Field Strength Meter - APD will deliver said meter [redacted] for use on AN-43. (Promised first week in May) 25X1

(6) Receiver Requirement - It would be very desirable to operate transistor transmitters in the 2-10 mc region with f.m. to save on the number of parts required and on power. No suitable NBFM receiver is known to be available but the HR060 is unsatisfactory because of its extremely narrow IF passband [redacted]. Hence, a receiver is needed. 25X1

(7) ST-2 Transmitter - [redacted] mentioned the fact that printing four manuals for each of the 60 units would be rather an expensive task, mainly because of the photography involved. [redacted] agreed that ASD had complained of the large number of manuals with the kits. Therefore, [redacted] is to finish 180 manuals, 3 for each unit. 25X1 25X1 25X1

(8) [redacted] brought up the idea of a project to [redacted] It was pointed out that although this is an excellent idea and deserves investigation, there are other more basic devices to be completed first. Primarily this includes a complete radio-switch-controlled [redacted] system. 25X1 25X1 25X1

(9) New Requirements - New requirements for the RT-1 and for information and spare parts for the J-163C have been given to [redacted] and are being taken care of. 25X1

5. Actions:

a. Obtain environmental specifications

b. Ship Stoddart Field Strength Meter to [redacted]

c. Obtain regulated power supply data 25X1

[redacted] 25X1

TBS/APD

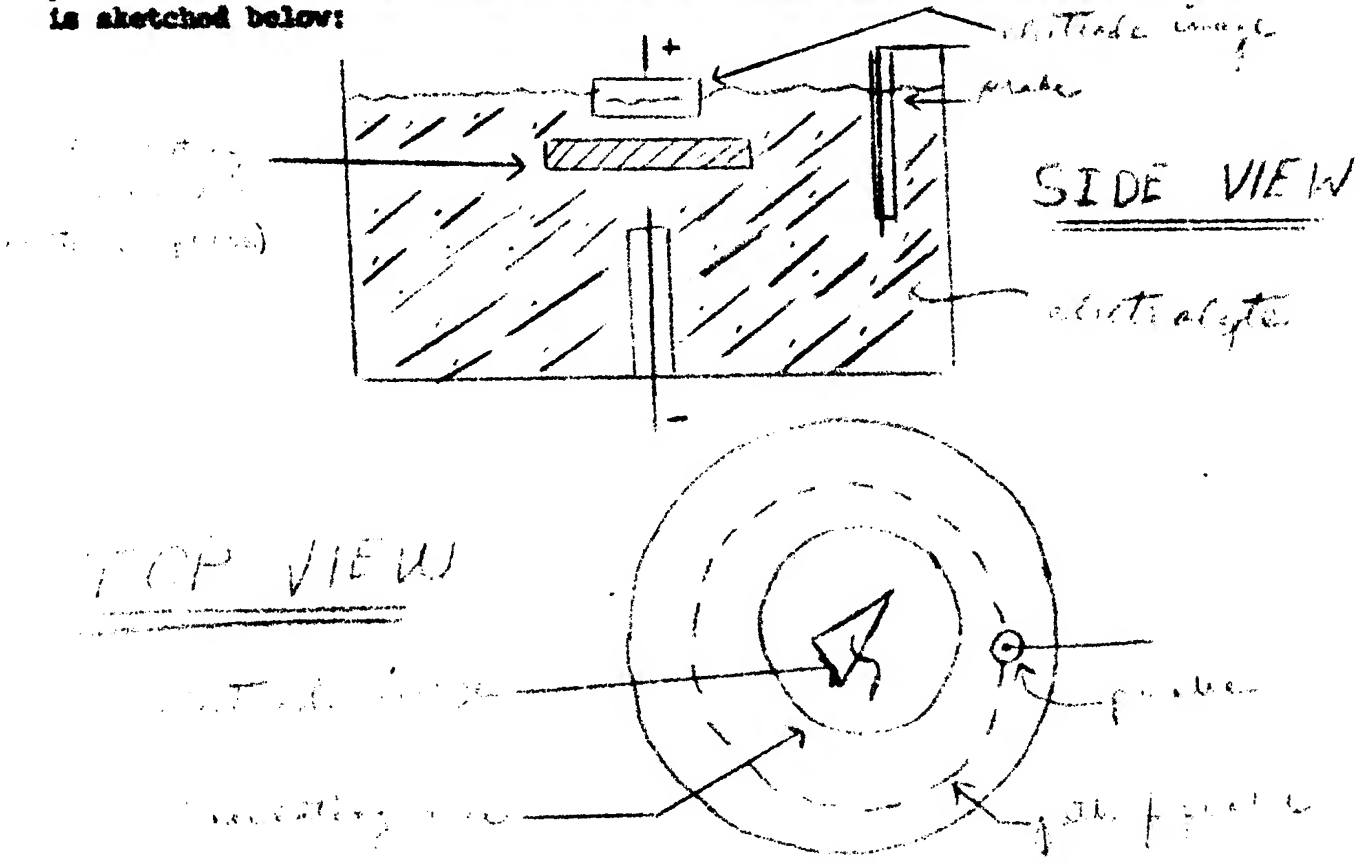
Distribution:
Orig. - P-113
1 - P-129C
1 - P-177
1 - P-163D
1 - AH-6
1 - AH-43
1 - AH-44
1 - Recorder
1 - Chrono

AST/ls

19 April 1956

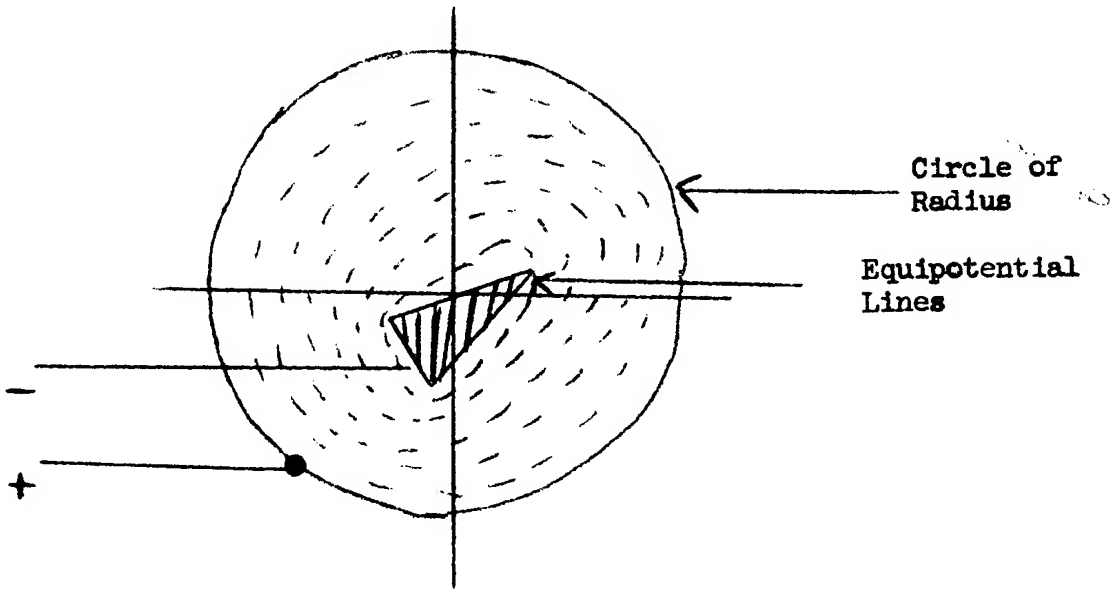
Image Analysis

Various experiments have been conducted in an electrolytic tank in an attempt to show that an electrode shape may be identified with the potentials on a boundary surrounding that electrode. The apparatus used is sketched below:



The apparatus consists of an electrode image, a tank of electrolyte containing the flattened sphere insulating layer, and a reference electrode. A probe electrode is inserted in the electrolyte at the "equator" of the flattened sphere and is rotated about the sphere. A plot of probe voltage vs angle is thus obtained.

An idea of what is happening above may be gained from the following picture (next page). Consider the image electrode to be at the origin of a plane of conducting material.



Consider the plane to be terminated in a circular boundary at ∞. This boundary is maintained at one potential; the image at another. Typical equipotential lines are shown. These lines approach the outline of the image when near the image and approach circles at an infinite distance. When the probe is rotated in a circle about the origin of the conducting plane, it will cross these equipotential lines and consequently will have a varying output voltage. The closer the probe circles the image electrode the greater and more rapid will be these changes as is obvious from the diagram. It is also evident from the diagram that at large distances from the center of the conducting plane, the probe output voltage will be nearly constant and will contain little information regarding the detailed shape of the image.

This "smoothing" effect on the probe output voltage is an inherent disadvantage to this system of scanning since it is a real loss of information which no improvements in stability, signal/noise ratio, etc., can overcome. Here also lies a main point which has yet to be carefully investigated, namely, the resolution of the method as a function of the probe distance from the image.

The writer thinks that although this is a very interesting experiment its successful application to the problem at hand is questionable. An important question which might be covered in the forthcoming reports is: To what else might this idea be successfully applied?

26 April 1956

J-177 [redacted] 25X1

A considerable number of changes have been made since the memo of 4 April. The low frequency (2700 kc) unit mentioned there, using Raytheon 2N114 germanium transistors, has been completed and is being tested successfully. In the most recent package [redacted] 25X1

[redacted] 25X1

[redacted] Various antenna tuning adjustments have been provided for matching various lengths of antennas. 25X1

An alternate and more suitable unit has been developed using Philco SST-6s at a frequency of 54 mc (fm). The packaging is identical to the 2700 kc unit. Although tests have not as yet indicated which unit has the better performance, it is obvious that the 54 mc unit is superior because it can be matched to the transmission line and antenna and will require no antenna tuning adjustments. It is expected that the maximum ranges of both units will be comparable.

The delivery [redacted] will take place 3 May 1956. 25X1

26 April 1956

[redacted] 25X1

[redacted] at present has a full load of work; their four capable project engineers are all fully occupied. Unfortunately, it seems that despite this effort which extends to nights and weekends, [redacted] is not working on some of the important projects which they have been given. 25X1 25X1

It is true that this situation could be corrected by hiring more engineers or by going to another contractor. It is my belief that measures such as these could only give temporary relief. There are an infinite number of combinations of power outputs, frequencies, modulations, camouflages, operating lives, etc., which can be built into transmitters and we apparently are not going to be satisfied until we build them all. For this, we are going to require either an infinite amount of time or an infinite number of engineers!

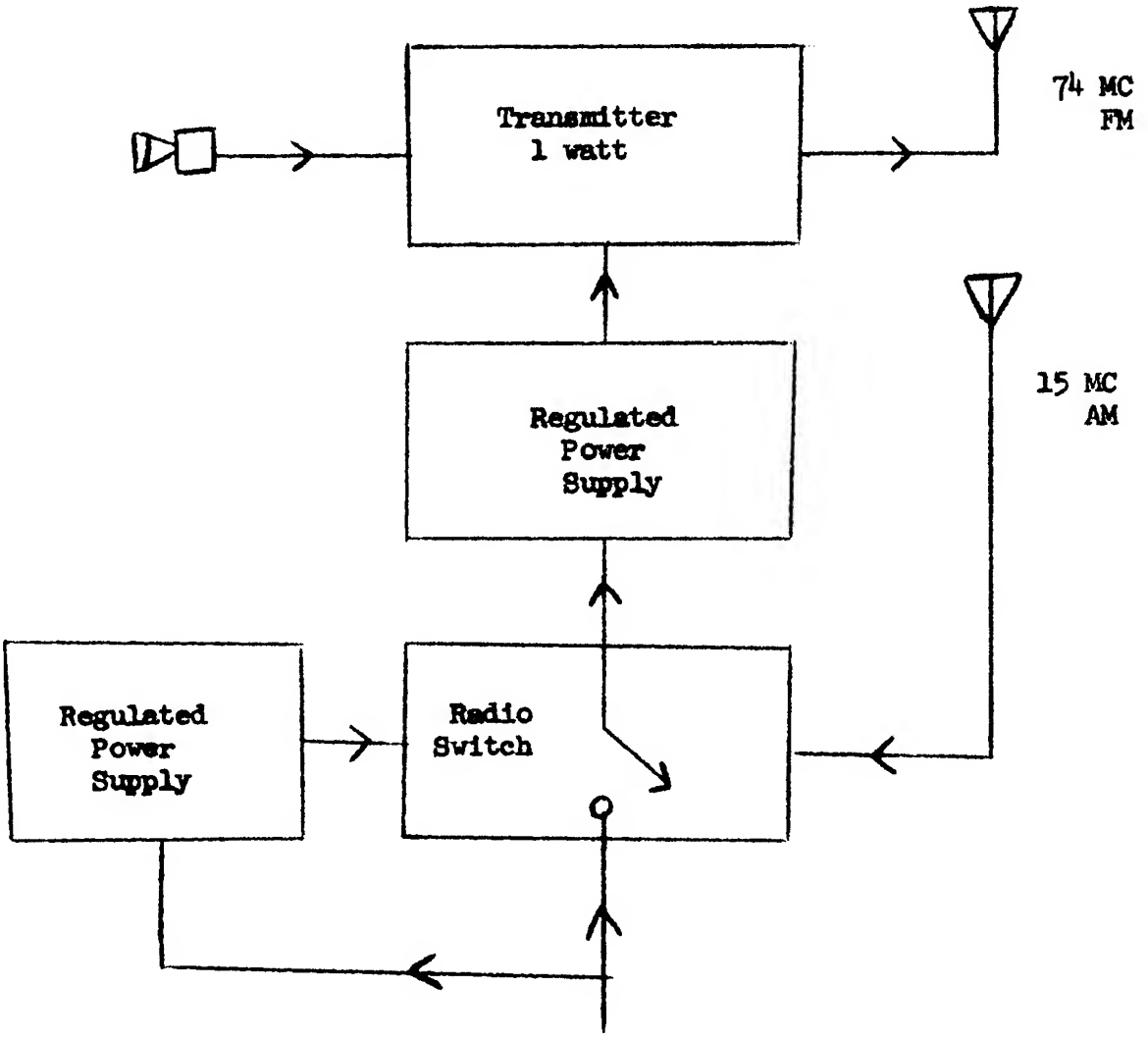
Perhaps we would do better if a certain small number of complete systems, from microphone to recorder, were outlined to do the majority of jobs with which we are faced. Basic units of such systems are already available at [redacted] and elsewhere and could be used as a starting point. 25X1

There are a number of advantages to a task oriented systems approach. First, a definite goal is set which is the [redacted] capability which we wish to achieve at some future date. 25X1

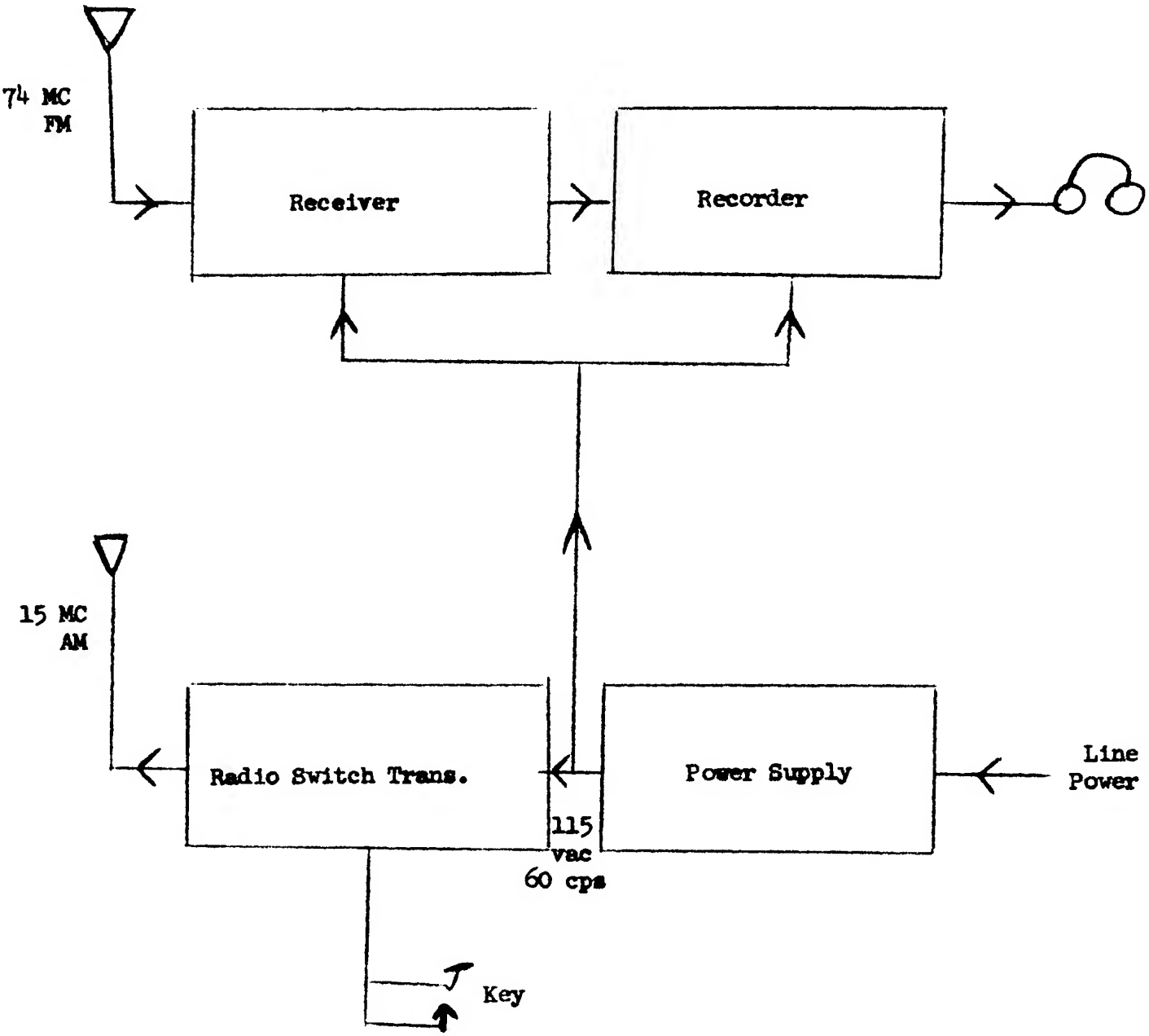
Second, such a plan eliminates the chicken-with-the-head-cutoff tactics which are presently in effect. (Every time a requirement comes in from ASD, a project starts at [redacted]. Many of those requirements can and have been thought of before and certainly could be lumped together considerably.) 25X1

Third, such a plan allows concentration on some of the problems which are common to [redacted] systems. A typical example is that of the regulated power supply. Everyone will admit that an efficient power supply giving regulated supply voltages and frequencies would be of value. Yet [redacted] is unable to spend any amount of development time, beyond the barest minimum, on such a supply because crash jobs are continually being piled on them. [redacted] himself says [redacted] has not advanced the state of the art appreciably since 1 January for this reason.) 25X1 25X1 25X1 25X1

For the sake of having a definite example a block diagram has been drawn on the following page for a [redacted] system. Most of the components are already being constructed at [redacted] Such a system as this would be the long range deluxe model of the proposed series of systems. 25X1 25X1



(other drawing on
following page)



This type of system plus tools and spare parts might be assembled to three or four suitcases.